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Sculpting light for new biophotonics applications

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Generalized Phase Contrast (GPC) is a power efficient approach for generating speckle-free contiguous optical distributions using spatial phase-only light modulation. GPC has been demonstrated in a variety of applications such as optical micro-manipulation [1], active microscopy [2], structured illumination, optical phase encryption, and recently in contemporary biophotonics applications such as for real-time parallel two-photon optogenetics and neurophotonics [3]. Our most recent GPC light sculpting developments will be presented. These include both static and dynamic GPC Light Shapers where lasers have to be actively shaped into particular light patterns [4]. We show the potential of GPC for biomedical and multispectral applications where we demonstrate phase-only light shaping of a supercontinuum laser over most of its visible wavelength range [5].

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